Astronomy
ES-2 The student will demonstrate an understanding of the structure and properties of the universe.

ES-2.9 Explain how technology and computer modeling have increased our understanding of the universe.
Taxonomy level: 2.7-B Understand Conceptual Knowledge

Previous/future knowledge: Students in 8th grade explained how telescopes, space probes, and satellites have been used to explore the solar system. Obtaining information beyond the solar system out into the stars and galaxies is new material for this course.

It is essential for students to know that with the development of increasingly more sensitive and sophisticated instruments, scientists are able to collect information farther and farther into the universe. Along with telescopes, devices that now collect millions of pixels of light can store the data on a disk or tape for image processing. A wide variety of non-optical telescopes and space-based observatories allow astronomers to probe regions of space that give off little or no visible light and to study many objects that emit little or no optical radiation at all. Upon gathering this information, computer programs can enhance the information to create images that help to unlock some of the mysteries hidden in the universe.

Assessment Guidelines:
The objective of this indicator is to *explain* how technology and computer modeling help to increase understanding of the universe; therefore, the primary focus of assessment should be to construct cause and effect models that show how this technology is helping in the study of the universe within and outside of our solar system.
In addition to *explain* appropriate assessments may require students to:
- *identify* types of technology that have been developed; or
- *infer* how our perceptions of the universe have changed due to this technology.